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May 17, 2021

**VIA ELECTRONIC FILING**

The Honorable Jocelyn G. Boyd  
Chief Clerk and Executive Director  
Public Service Commission of South Carolina  
101 Executive Center Drive, Suite 100  
Columbia, SC 29210

**Re: Joint Petition of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC to Establish a Consolidated Informational Docket for Review and Consideration of Grid Improvement Plans (NDI Opened Pursuant to Commission Order No. 2020-533) Docket No. ND-2020-28-E**

**Informational Update on Stakeholder Meeting Held May 12, 2021**

Dear Ms. Boyd:

On August 12, 2020, by Order 2020-533 in Docket No. 2019-381-E, the Commission approved Duke Energy Carolinas, LLC's ("DEC") and Duke Energy Progress, LLC's ("DEP") (collectively, the "Companies") joint request to establish an informational docket for review and consideration of its Grid Improvement Plans. As a result of that order, on August 14, 2020, the Commission opened the above-referenced NDI docket.

On April 15, 2021, the Companies filed the 2020 Grid Improvement Plan Status Report for DEC and DEP. This report showed how the Companies are performing in terms of program costs and units compared to its targets.

On May 12, 2021, the Companies held a South Carolina Grid Improvement Plan 2020 Status Report virtual forum. During this session, subject matter experts discussed 2020 program benefits and accomplishments, highlighted upcoming stakeholder engagement opportunities and were available for additional questions submitted during the forum. A survey will be sent to participants to learn what other topics would be of interest to participants in future engagements.

The following attachments enclosed with this update provide additional information on the virtual forum.

- Attachment A: Save the Date
- Attachment B: Save the Date and Invitation Distribution List
- Attachment C: Invitation to Virtual Forum

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- Attachment D: List of Forum Attendees
- Attachment E: South Carolina Grid Improvement Plan 2020 Virtual Forum Presentation
- Attachment F: Virtual Forum Follow-Up Survey

The Companies will continue to inform stakeholders, the ORS and the Commission on developments in the Companies' Grid Improvement Plans.

Sincerely,



Heather Shirley Smith

Attachments

cc: (via email w/ attachments)

Counsel for Office of Regulatory Staff  
Department of Consumer Affairs  
Counsel for Sierra Club  
Counsel for Walmart, Inc.  
Counsel for SELC on behalf of SC NAACP, SCCCL & Upstate Forever  
Counsel for Nucor Steel-South Carolina  
Counsel for SCSBA and Cypress Creek Renewables  
Counsel for SCEUC  
Counsel for Vote Solar  
Counsel for CMC Recycling  
Hasala Dharmawardena

**Underwood, Lizzy**

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**From:** Davidson, Hilary  
**Sent:** Tuesday, April 6, 2021 2:08 PM  
**Subject:** Save the Date: Duke Energy South Carolina 2020 GIP Status Report Virtual Forum

**Save the Date**

2020 South Carolina GIP Status Report Virtual Forum

As a stakeholder who has expressed an interest in Duke Energy's Grid Improvement Plan (GIP) initiatives, we are happy to announce our plans to host a 2020 South Carolina GIP Status Report Virtual Forum. During the forum, tentatively scheduled from 1:00 PM – 2:00 PM on May 12<sup>th</sup>, 2021, we will review the report, share insights and answer questions.

We intend to file the 2020 South Carolina GIP Status Report in Docket No. ND-2020-28-E by mid-April, and will include the link to the filing in a follow-up email to you, along with additional details about participating in the forum. In the interim, if you wish to participate, please save the date and time on our calendar.

Thank you very much for your continued interest in Duke Energy's Grid Improvement Plans. If you have any questions, need additional information or if you would like to request a topic to be covered in the forum, please feel free to reach out to [GIP-Engagement@duke-energy.com](mailto:GIP-Engagement@duke-energy.com).

Sincerely,

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**Underwood, Lizzy**

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**From:** Davidson, Hilary  
**Sent:** Monday, April 19, 2021 4:02 PM  
**Subject:** FINAL - You are invited! 05/12 Duke Energy Virtual Forum - 2020 SC Grid Improvement Plans Status Report



Good afternoon,

We'd like to invite you to a virtual forum that we are hosting on May 12<sup>th</sup>, 2021 from 1:00 – 2:00 p.m. The purpose of the forum is to update interested stakeholders on the continued progress we have made on the Grid Improvement Plans, provide program and project highlights, listen to your feedback and respond to any questions that you may have. In Docket No. ND-2020-28-E, you can find the [2020 SC GIP Status Report](#) for your review.

If you wish to participate in the virtual forum, we ask that you **please register by Wednesday, May 5<sup>th</sup> using this link:** [Register here!](#)

For assistance with registration, please email: [Eventsupport@duke-energy.com](mailto:Eventsupport@duke-energy.com). If you have any questions, need additional information or if you would like to request a topic to be covered in the forum, please feel free to reach out to [GIP-Engagement@duke-energy.com](mailto:GIP-Engagement@duke-energy.com).

Thank you very much for your continued interest in Duke Energy's Grid Improvement Plans, and we hope that you will join us on May 12<sup>th</sup>.

Sincerely,  
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Davidson, Hilary	Duke Energy
DeRoberts, Emily K	Duke Energy
Duffy, Kris C	Duke Energy
Epps, Ashley Hollis	Duke Energy
Hamilton Davis	Southern Current
Henderson, Megan E.	Duke Energy
Hescock, Taylor	Duke Energy
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Moore, Eugene	Duke Energy
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Oliver, Mark	Duke Energy
Palmer, Miko	Duke Energy
Pool, Gretchen	SC ORS
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Underwood, Lizzy	Duke Energy
Wells, Tiger	Duke Energy
Will Harlan	Sierra Club
Wurst Jr., James E	Duke Energy



# South Carolina Grid Improvement Plan

2020 Status Report Virtual Forum – May 12, 2021

ATTACHMENT

ELECTRONICALLY FILED - 2021 May 17 8:54 AM  
ND  
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- Welcome
  - Safety Moment
  - Meeting Logistics
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- Questions
- Climate Risk & Resiliency Study
- Continuation of GIP for 2022 and Beyond



Spring is here and people are excited to get outdoors to plant trees, shrubs and flowers as well as begin outdoor construction projects.

But first, contractors, homeowners, business owners or anyone preparing for a digging project should make an important call to 811, the free, nationwide service “Call Before You Dig” hotline and ask that the underground utilities on the property be properly located and marked.

This action prevents damage to underground utilities, prevents personal injury and avoids electric and other utility outages along with costly repairs.

In 2019, the U.S. Common Ground Alliance reported approximately 532,000 excavation-related damage events in the U.S., an increase of 14 percent from 2018, the latest year for which figures are available. Estimated damages in 2019 total approximately \$30 billion in direct and indirect losses.

**811 website:** <https://call811.com>

# Meeting Logistics

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This meeting will not be recorded by Duke Energy and we ask that attendees do not record as well.



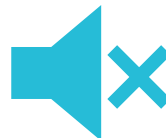
The presentation will be distributed after this session and filed with the Commission.



For optimal viewing of the presentation, please maximize the window by clicking the ellipsis at top right, scrolling down and selecting "Full Screen." To minimize, de-select "Full Screen."



For technical difficulties, please use the chat feature to let us know if you are having challenges seeing or hearing anything. We will be monitoring those comments and will assist you with troubleshooting by chatting with you directly.



All attendees, apart from designated speakers, are muted to mitigate background noise disruptions.



Please submit questions through the Teams meeting chat. Speakers will address questions at the end of the presentation as time allows. If you have questions aside from today's topic or if time does not allow us to answer today, we will follow up with you directly.



Self-Optimizing Grid self-healing networks continued to prevent millions of customer minutes of interruptions in South Carolina.



A significant Long Duration Interruption project crossing the Pee Dee river was completed.



The Substation Flood Mitigation subprogram, which builds in protection of substations most vulnerable to flood damage, was completed in South Carolina.



The pandemic presented challenges for our execution teams in the form of limited resources, planned outage restrictions and supply chain interruptions.

# South Carolina GIP – 2020 Summary

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Capital Expenditures 2019 and 2020	DEC - SC	DEP - SC
Cumulative Target	\$178,027,060	\$70,080,782
Cumulative Actuals	\$143,285,954	\$67,206,707
Cumulative Variance	(\$34,741,106)	(\$2,874,075)
2019 Variance	\$996,487	(\$1,384,760)
2020 Variance	(\$35,737,593)	(\$1,489,315)

## Self-Optimizing Grid Benefits

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Self-Optimizing Grid (Inception-to-date as of 12/31/2020)	DEC	DEP
Successful Operations	100	104
Customer Interruptions Saved	76,742	74,264
Customer Minutes Interrupted Saved	16,967,369	13,700,378

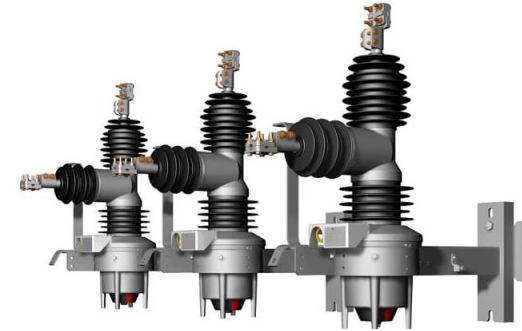
- Tropical Storm Zeta (DEC) - 6 operations, 3,952 CI saved, and 1,927,300 CMI saved.



# Self-Optimizing Grid Program

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Self-Optimizing Grid (01/01/20 - 12/31/2020)	DEC	DEP
Number of circuits upgraded to SOG standard in 2020	13	20
Number of reclosers installed in 2020	21	38



Electronic Reclosers



Capacitor and  
Voltage Regulator  
Controls



# Targeted Undergrounding Program

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Targeted Undergrounding (01/01/20 – 12/31/20)	DEC	DEP
Miles Completed	4.89	2.95
Projects (Neighborhoods) Placed in Service	6	16
Total Number of Customers	444	384

- DEC has completed projects in Greenville and Spartanburg Counties.
- DEP has completed projects in Darlington, Florence, Marion, Sumter and Williamsburg Counties.

# Targeted Undergrounding Project – Spartanburg, SC

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Hampton Heights Neighborhood

Duke Energy - General Information for Discussion

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# DEC Integrated Volt Var Control (IVVC) Highlights

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## Substations

- 16 substations finalized all engineering activities
- 11 sites completed civil construction work
- 4 control house panels were installed
- 4 sites completed telecom circuits
- 2 load tap changers upgraded



Greenville Main Substation Site Visit

## Circuits

- Drone flights were completed on 109 circuits
- 45 circuits completed GIS/mapping updates
- 102 regulator controls were upgraded
- 15 capacitor banks were installed
- 7 circuits finished all construction activities and are IVVC Ready
- Created processes for first of kind work for capacitor installs and voltage regulator control upgrades



CBC-8000  
Capacitor Control



CL7 Regulator  
Control



Capacitor with 3 Phase Sensing



# DEP Long Duration Interruption Project - Cheraw

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- Project relocated three feeders from the swamp by combining to one pole line closer to the road on 100' steel poles on 5' concrete base
- Now 21 steel poles have been installed, covering approx. 8,000 feet
- The Pee Dee River crossing is approximately 661 feet in length
- Improved service to 1,863 customers
- ~4 million customer minutes of interruption in previous three years
- Project completed on July 7, 2020



# DEP Long Duration Interruption Project - Cheraw

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# Challenges of the Cheraw Project



# Challenges of the Cheraw Project





# Transmission Projects Highlights - DEP

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## Placed in Service During 2020

58

System Intelligence projects to improve remote grid visibility & control

40

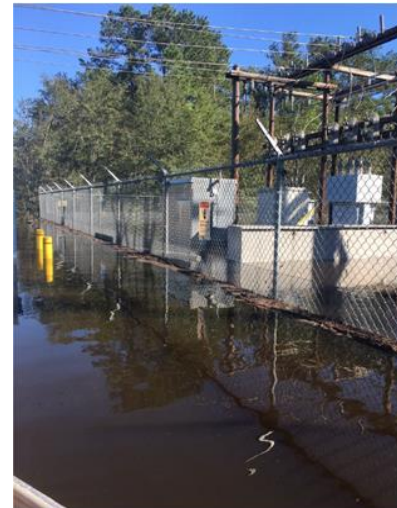
Distribution feeder breaker circuit breaker upgrade projects covering 60+ breakers

16

Transmission Substation reliability upgrades including breaker and transformer upgrades

12

Hardening and Resiliency projects including substation flood prevention and animal outage prevention



Nichols, SC: Flooding during Hurricane Matthew (L) ; After flood wall and gate installation (R)

## SC Benefit Highlights

- Nichols flood prevention wall completed
- Florence area Transmission 115kV and 230kV line segment rebuilds, improved PQ for C&I customers
- Substation breaker & transformer upgrades to reduce retail customer outages in Florence, Dillon, Marion, Mullins
- System Intelligence upgrades across footprint to improve outage response & restoration time, expand grid visibility

Duke Energy - General Information for Discussion



# Transmission Projects Highlights - DEC

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## Placed in Service During 2020

30

System intelligence projects to improve remote grid visibility & control, outage response and restoration time

26

Hardening and Resiliency projects including Transmission circuit segment rebuilds and animal outage prevention upgrades

15

Transmission substation reliability upgrades including breaker and transformer upgrades

10

Hardening and Resiliency projects including substation flood prevention and animal outage prevention



Animal Resistant Substation Fence



Digital Relay Protection & Control Panel

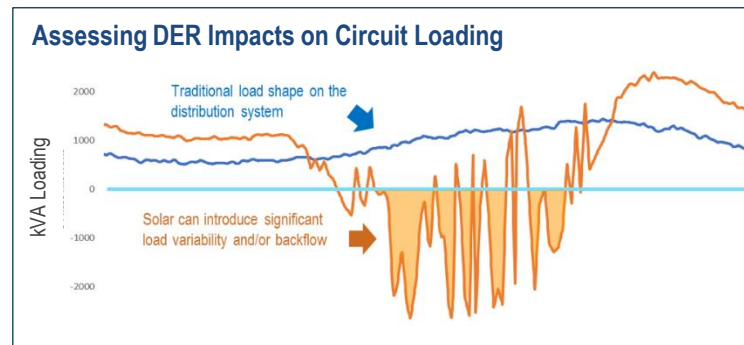
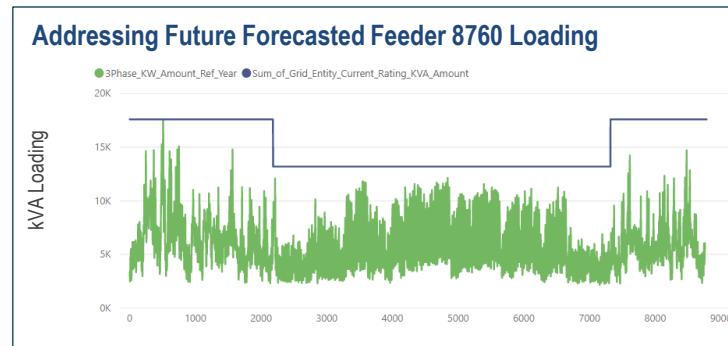
## SC Benefit Highlights

- Prevention of animal-caused outages at 4 upstate substations (one of the leading Transmission causes of CMI) - Anderson, Belton, Augusta Rd, Eastover
- Transmission 44kV line segment rebuild in Campobello area; reduced retail customer outages & improved PQ for C&I customers
- Upgrade of 13 100kV breakers at Hodges Tie (Greenwood area) with state-of-the-art apparatus capable of quickly and effectively isolating faults and minimizing customer impacts of system disturbances

# Advanced Distribution Planning (ADP) Tool

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- Integrating sophisticated granular load forecasts
  - Current 3-5 year window evolving to 10 years
  - New capabilities for multiple planning scenarios
- New power flow resolution
  - From peak hour assessment to 8760 assessment
- Assessment of new solutions
  - DERs including battery storage systems
  - Capture benefits of D-sited options for G and T
- Integration and automation of new tools and data
  - New server based power flow models and integration
  - Supports more complex planning for a dynamic grid
  - Tools and processes will evolve as planning needs change



# Advanced Distribution Planning (ADP) Tool

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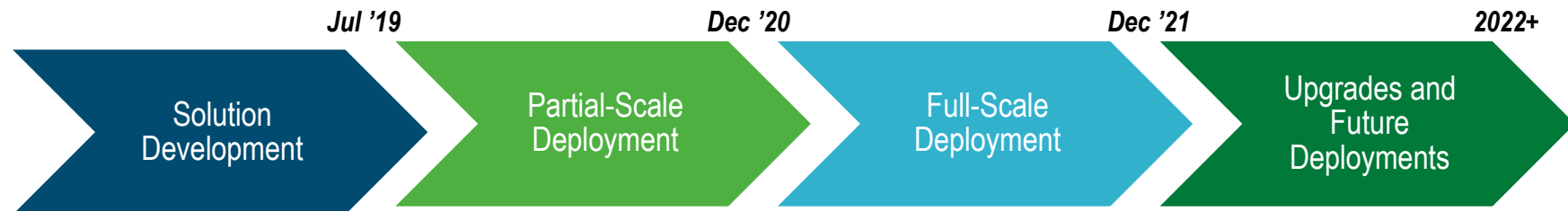
## Hybrid Solution

- Combines power flow software with advanced analytics capabilities
- Capable of engineering DERs as a Load Violation Solutions (non-wires alternative)

## Introducing Automation

- Reduced engineering time spent resolving modeling issues and performing circuit analyses
- Time-saving analytics for identifying mitigation solutions to accommodate higher levels of DER
- Reduced engineering time when evaluating DER as a non-wires alternative
- Analysis of more solution alternatives and consistency in investment decisions

## ADP Toolset – Carolinas System



# South Carolina Power Electronics Program

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## Overview

As the adoption of distributed energy resources (DER) (e.g., customer-owned solar and energy storage) reaches critical levels and microgrid technology matures, protective device technology must also advance to appropriately detect and respond to rapid voltage and power fluctuations that often accompany non-dispatchable resources such as solar.

Integrating advanced solid-state technologies like power electronics (i.e., static VAR compensators and other solid-state voltage support equipment), better equips the distribution system to manage power quality issues associated with increasing DER penetration.

The program is still in its early stages and current plans are small pre-scale deployments to validate capabilities and benefits.



## Accomplishments

- Subject Matter Experts identified for technical guidance, conducting field studies, & circuit analyses
- Completed proof of concept deployments
- Use cases have been defined



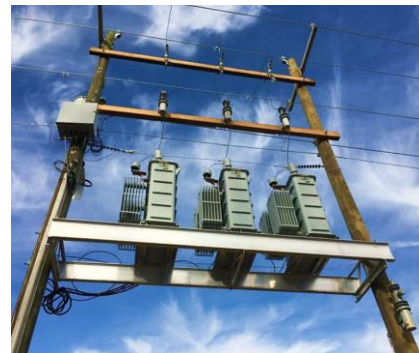
## Upcoming Activities

- 2021: Review & finalize deployment sites to put into production
- 2021: Work with vendor & distribution planning engineers to develop circuit evaluation methodologies
- 2021: Develop 12kV and 25kV design standards for medium voltage statcom devices



## Issues and Risks

- 25KV medium voltage statcom solutions are still in production with an expected release Q3-Q4 2021
- Cellular signal strength will need to be conducted for each field site
- Future version of ADMS will provide ability to do real-time optimization of DVARs



**Candidate Locations\***  
**(Power Electronics for Volt/VAR)**

Circuit	Circuit ID	Jurisdiction
Wrenn Ret 1208	02821208	DEC
Wrenn Ret 1209	02821209	DEC
Matrix Ret 2408*	02412408	DEC
CCSC 24KV*	T2825B01	DEP
Salem Crossroads*	T3060B02	DEP

\*24KV Medium Voltage Solution not expected until Q3-Q4 2021



Please submit questions through the Teams meeting chat.

For questions not addressed during this virtual forum, Duke Energy will follow up directly with the individual who posed the question.

# Climate Risk & Resiliency Study

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## Objective

Assess and prioritize climate-related impacts to Transmission & Distribution (T&D) system

## Scope

T&D system within DEP & DEC service area for both NC & SC



# Continuation of GIP for 2022 and Beyond

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- Transmission and Distribution grid work and improvements will continue in South Carolina
- Continued engagement on next steps
  - Extended information sessions
  - Feedback from external stakeholders





*BUILDING A **SMARTER** ENERGY FUTURE®*



**Duke Energy 2020 SC Grid Improvement Plan Virtual Forum Follow-up Survey**

1. On a scale of 1-10, how well did this status report and forum enhance your understanding of the progress made in Duke Energy's South Carolina GIP through 2020?

0	1	2	3	4	5	6	7	8	9	10
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Comments:

2. On a scale of 1-10, how satisfied are you with the opportunity to provide feedback and dialogue with Duke Energy during and after this virtual forum?

0	1	2	3	4	5	6	7	8	9	10
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Comments:

3. On a scale of 1-10, how willing are you to participate in future engagements with Duke Energy focusing on the Grid Improvement Plan?

0	1	2	3	4	5	6	7	8	9	10
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Comments:

4. Have you participated in previous virtual or in-person forums on this topic?

Yes / No

5. Would you be open to providing additional input or data in advance of future virtual forums?

Yes / No

6. Due to COVID-19, all recent stakeholder sessions have been virtual. To help plan for future sessions, when would you like to see a shift to in-person sessions?
  - a. Fall 2021
  - b. Early 2022
  - c. Late 2022
  - d. Stay with virtual sessions
7. What changes would you suggest for future meetings?
8. What GIP topics, programs or projects would you be interested in engaging on or hearing more about in future sessions?
9. For future extended information sessions, would you prefer brief single-topic forums or a longer multi-topic forum?
10. What grid-oriented projects/programs would you recommend Duke Energy investigate for future grid investments?